1: Jochelson E-5 (1900-01) 1908 RY4 Koryak RY4

on rocks. The lichen and moss tundras are frequently intermixed, one forming islands in the other. Wherever the tundra is hilly, or where it has slopes which serve to drain certain parts of it, phanerogamous plants appear.

However, the large tundras enumerated above do not represent a continuous plain surface. At some places they are cut up by ravines or by dales watered by rivulets, or they form a hilly surface with mounds and rocks, denuded by atmospheric influences. In this manner, plain marshy, swampy spaces, covered with stagnant water which cannot penetrate the frozen soil, alternate with more or less dry earthy or stony slopes from which all precipitation is carried off, or with dank dome-like or oblong hills standing alone in the midst of the tundra, and often covered with bushes and trees. These hills are called yedoma (едома) by the Russian settlers of northern Siberia, — a name of unknown origin.

Neither are these tundras entirely devoid of arboreal vegetation, which is found here and there, forming, as it were, oases. Some ravines and the banks of some streams have a scant growth of slender willows, thin poplars, and crooked, stunted birches; and the summits and slopes of hills are often covered with low stone-pines, which serve as the only but excellent fuel for the nomadic Koryak and for travellers who occasionally spend the night in the tundra. The hard and solid wood of the stone-pine and its creeping roots burn slowly, and produce a strong heat.

Coasts. — The coasts of the Koryak territory, particularly those of the Okhotsk Sea, have many small bays, which evidently have proved favorable to the formation of permanent Maritime settlements. With the exception of the eastern shore of Kamchatka, almost the entire coast-line is a continuous steep rocky shore (either of granite or gneiss, as for instance on the Taigonos Peninsula, or of schistose rock), with reefs and small rocky islands lying near by, upon which the Koryak of former times used to seek shelter when attacked by enemies. Only the mouths of the rivers are sandy. For this reason the shores, particularly those of the bays of the Okhotsk Sea, are very difficult of access by vessels. Besides, the water in the bays is very shallow, and the sand-bars and sand-banks at the mouths of the rivers prevent vessels from coming close to shore.

The largest bays are those of Gishiga and Penshina in the Okhotsk Sea, and Baron Korff's Bay in Bering Sea. It is curious that on Steller's map of the Okhotsk-Kamchatka region the Taigonos Peninsula is not indicated, and the two bays which are separated from each other by that peninsula are thrown together under the name of Penshina Bay.[1] Gishiga Bay extends into the continent for about 170 miles. The head of Gishiga Bay is so shallow, that steamers have to anchor from sixteen to twenty miles below the

[1] See Steller, map opp. p. 12.

1: Jochelson E-5 (1900-01) 1908 R14 Koryak R14

and rapid. The mountain-ridges from which these rivers take their source are not far from the seashore, which accounts for the steepness of the river-valleys. The length of the large rivers varies from forty to two hundred and fifty miles. Compared with the gigantic rivers flowing into the Arctic Ocean west of the Stanovoi Ridge, these rivers appear as pygmies. Of their rapidity one can judge from the fact that it is possible to row only seven miles up the Gishiga River, which, next to the Penshina, is one of the largest rivers of that region. Farther up the boat has to be towed.

The Penshina is to a certain extent an exception in this respect. Not only is it longer than all the other rivers of the Koryak territory, but in its lower course it is more in the nature of a large river traversing a plain. In the eighteenth century the cossacks plied the Penshina River in boats, on the way from Kamchatka to Oklansk[1] and farther to the north. Prior to the advent of the Russians, there was a large village of Maritime Koryak at the mouth of the Oklan River, the largest tributary of the Penshina. Fishing was the main industry of the inhabitants, and by it they subsisted.

Almost all the rivers of the Koryak territory have cut their way through the mountains. Piling up a rocky bed, they carry off in their rapid course the smaller fragments to the seashore, and either deposit them near the mouth of the river, or form sand-bars near by in the sea. Although some of the rivers flowing into Bering Sea — as, for instance, the Dranka and Karagha Rivers — have in their upper course all the characteristics of mountain-streams, when they reach the coastal tundra strip, they take a more quiet course, owing to which the bay near the mouth of the Karagha River offers a safe harbor.

Especially in the rainy season, during the summer, and when the snow is melting after the ice breaks up, the rivers are full and raging; but in dry seasons they are quite shallow. In summer, when there are no rains, it is possible to wade across the Gishiga River at a distance of only forty-five miles from its mouth. Owing to these conditions, the rivers of the Koryak territory cannot be depended upon as a means of communication between the various branches of the tribe.

The unusual force and height of the tides in the long and narrow Gishiga and Penshina Bays of the Okhotsk Sea also tend to the formation of sand-bars, and they are destructive to the coastal rocks. The rocky mouth of the Penshina River near the village of Kamenskoye is blocked by large bowlders and small rocky islands. Up to this time no one has made any regular observations of the tides in the Okhotsk Sea; but, according to information obtained from Russian seamen, the spring-tides and neap-tides in

[1] Oklansk (Оклонскъ) was a fortified Russian settlement (see Chapter XIV) founded by the cossacks in 1690, after the destruction of the Koryak village of the same name.

1: Jochelson E-5 (1900-01) 1908 RY4 Koryak RY4

they have an ingenious device, which is also found among the Central Eskimo.[1] The oar is placed in two crossing thong loops, which are attached to the rails. To prevent the oar from slipping in the loops, it has two wooden projections with notches, into which the loops are laid. One loop lies in the

Fig. 81 ($\frac{1}{15}\frac{1}{15}$). Model of Boat. Length, 105 cm.

upper, the other in the lower notch. The loops are fastened to wooden guards, which cover the gunwale and protect the skin from the friction of the oars (Fig. 82). Among the Eskimo the guards are made of bone.[2]

Fig. 82. Details of Rowlock (from a model, $\frac{1}{15}\frac{1}{15}$).

The Koryak have not as yet adopted the rudder, but steer with an oar. The blade of the stern oar is shorter but wider than the blades of the ordinary oars. Usually one half of the blade of the stern oar is made of bone of whale, which is sewed to the wooden half by means of small thongs.

The Koryak are better sailors than the Kamchadal, but still they cannot be called real seamen. They do not undertake long voyages, and rarely sail far away from the shores. In summer they often cross Penshina Bay (the inhabitants of Kamenskoye sometimes sail on to the Itkana), but such trips are made in calm weather only. With all their elasticity, the skin boats cannot withstand stormy seas. In times of stormy or foggy weather the men do not venture out, because the danger of tearing the skin cover on rocks is too great. When a rent of considerable size is torn in the skin cover, the boat sinks instantly. Small holes or openings that are caused during the voyage, near the water-line, are caulked with grease, and the travellers try to reach the shore as quickly as possible. Wooden scoops are employed for bailing out the water.

The Koryak have a rectangular sail made of dressed reindeer-skins sewed

[1] Compare Boas, Central Eskimo, Fig. 481, p. 528.

[2] Compare Boas, Central Eskimo, p. 529.

1: Jochelson E-5 (1900-01) 1908 RY4 Koryak RY4

this reason the ribs which join keel and rails slant upward. Thus the cross-section of the bottom of the kayak has the form of an obtuse angle. Thin boards fastened with thongs to the inner sides of the ribs, and running the full length of the kayak, between the rails and the keel, give additional strength. The deck is formed by cross-bars running from one rail to the other. The manhole is near the middle of the deck, which is also strengthened by longitudinal strips. The manhole is formed by an oval hoop. A broad board lying at the bottom of the boat under the rear end of the manhole serves as a seat, which is usually covered with a piece of sealskin. Like the skin boat, the kayak is covered with thong-seal skins. Ordinarily two skins, the hair of which is not always removed, are sufficient. After the kayak has been covered with skin, the manhole is placed in position. The cover is so cut at the manhole as to leave enough material to turn in the edges, which are sewed around the hoop by means of thongs.

The kayak is very light, so that it can easily be lifted with one hand. The weight of one is 32 pounds. Its length is 269 cm. and its maximum width (i. e., the diameter of the manhole) is 75 cm. Its height is 28 cm.

Near the prow and the stern of the kayak, skin handles are sewed for pulling it out of the water, either upon shore or upon floating ice, or for carrying it across promontories. In certain settlements only a double-bladed oar, like that of the Eskimo, is used with these kayaks. It is held with both hands, in the middle, and the two terminal blades are used alternately. In Itkana and Paren two paddles with short handles are used, the blades of which have on one side pieces of bone of whale sewed on, which look like fins. These small oars are 41 cm. in length. They are tied to the rim of the manhole with a thong one metre in length, so that they can be dropped into the water or placed within the kayak while casting the harpoon or while shooting. With these short paddles they row alternately with right and left hand, bringing their hands down almost to the level of the water.

Sitting in the manhole, the hunter can stretch his feet under the deck of the kayak. In the kayak he places the harpoon-heads, the throwing-board, the bag with the harpoon-line, and his arrows. In the hold of the kayak are kept the harpoon-shaft, spears, and gun. When making ready for an attack on sea-animals, the hunter places the harpoon on deck, first thrusting the end of the shaft into a skin loop which is sewed to the deck of the kayak near the prow.

The progress of the kayak in calm weather is extremely fast; but its use is not without danger, as it is easily upset by wind or waves, and it is necessary to balance it carefully while paddling. In stormy weather the Koryak do not venture upon the sea in kayaks.

Dug-Outs. — In the settlement of Kamenskoye and in northern Kamchatka dug-out canoes are also used, like those employed by the Yukaghir

22:Barrett-Hamilton and Jones--298[3] N-2 (1897) 1898 Koryak
116, 502

"Probably the quaintest sight we have ever seen, or ever will again see, was this skin boat with its uncouth crew of skin-clad natives paddling off to the ship, the paddles not moving together like those of an English boat, but by sides, port alternating with starboard, like the legs of an American pacer. Could the writer of 'Punch's Prehistoric Peeps' have been with us, he could hardly have failed to recognize in the originals what he had only drawn from imagination, a striking compliment to the faithfulness of his invention. Almost quainter still was the grave and courteous bow with which their interview with the captain began and ended, and their consumption of an impromptu meal of tea, biscuit, and various scraps served out to them by the bluejackets, was the source of much amusement forward."